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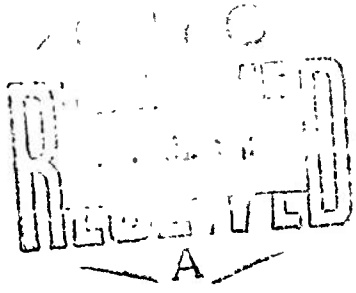

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13 ABSTRACT

The unsuccessful history of attempts to measure the relative importance of job factors is reviewed. The uses to which importance data could be put are reviewed and several hypotheses are advanced concerning the concept of importance of job factors. Seven methodological requirements for a measure of importance are advanced as improvements over past approaches. The development of an indirect two-stage method for measuring importance is described. It meets all seven of the stated requirements.

The method was applied on four U. S. Navy destroyers. The resulting estimates of the relative importance of work, pay, supervision, and coworkers showed that situational determinants operated to vary mean importance from ship to ship. Respondents were grouped by means of cluster analyses into relatively homogeneous clusters with common patterns of job factor importance. Different personnel decisions may be appropriate for respondents from different clusters.

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Importance of Job Factors to Navy Personnel

Stanley M. Nealey

The objective of this project was to develop and test an indirect method of measuring the perceived relative importance of characteristics of work. The four work characteristics studied were pay, supervision, type of work, and co-workers.

The relative importance of work characteristics has been a topic of frequent study for several decades, and has been approached by a variety of different methods. For instance, Blum and Russ (1942) used the paired comparison method to measure the perceived importance of five work factors, Jurgensen (1947, 1948) had ten job factors ranked for importance, and Raube (1947) had his respondents check the five most important from a list of 71 work factors. Several studies, including Watson and Seidman (1939) and Walker and Guest (1952), have used ratings to measure the importance of work factors. The open ended question was used by the Opinion Research Corporation (1951), and Evans and Laseau (1950) report an indirect approach to measuring the importance of work characteristics. They content analyzed thousands of letters written by employees in a General Motors contest entitled "My job and why I like it."

By 1957, Herzberg, Mausner, Peterson, and Capwell were able to review 20 studies of the relative importance of work characteristics. These authors, generalizing from the studies they reviewed, listed 10 factors in the following order of decending importance: security, opportunity for advancement, company and management, wages, intrinsic aspects of job, supervision, social aspects of job, communication, working conditions, and benefits. Lawler has more recently (1971) reviewed 49 studies that involve importance of work factors. The research area has obviously been a busy one.

Possible uses of importance data

The popularity of research on the importance of work factors is not surprising considering the variety of uses to which reliable and valid importance data could theoretically be put. Among these are the following:

1. Improve the match between characteristics of the applicant or employee population and characteristics of the work situation. If an applicant considers highly important certain aspects of work which the prospective work situation lacks or has in limited quantity, it may be unwise to hire the applicant. Or, current employees who find factors important but unavailable in their present work situation might need to be transferred, retrained, or upgraded to improve the employee-situation match.

2. The suggestions under (1) above assume that applicants and current employees are selectable or modifiable or transferable while the work situation is viewed as static. An alternative approach to person-situation mismatches is to seek to change the work situation. This may involve changing policies, redesigning work, training supervisors, reconstituting work groups, changing organization images, and rethinking the compensation system. For instance, all of these modifications might be necessary when the Navy is faced with the end of the draft and the all-volunteer force. Without changes it may be that sufficient numbers of qualified applicants cannot be recruited and retained.

3. Importance data can serve as the basis for inferences about needs and goals. For example, Jurgensen (1947, 1948) made such inferences about his respondents (they were applicants for employment). In fact, inferring needs and goals may be the most common use of importance data.

4. Importance may provide information about job satisfaction. Work factors considered highly important to current employees may be those that have become salient because they are frequent sources of satisfaction or of

dissatisfaction. Friedlander (1965) has found some support for this notion.

5. Another possible use of data on the relative importance of job factors is to use them as a means of weighting job satisfaction scores with the aim of developing a more useful measure of overall job satisfaction or of predicting some job related behavior such as turnover. Several investigators including Ewan (1967) and Blood (1971) have tested this notion using overall job satisfaction as the criterion. Wikes and Hulin (1968) have attempted to predict turnover using importance weighted measures of job satisfaction. None of these approaches was successful. This idea remains intuitively appealing, however, since it seems logical that sharp dissatisfaction or high satisfaction with trivial aspects of the job is unlikely to affect behavior, while dissatisfaction or satisfaction with important aspects of the job might well impact on job behavior.

6. Importance could be conceived of as one term in the definition of job satisfaction. Respondents could be asked to indicate the relative importance of job factors and whether these factors have positive or negative weight (i.e., "opportunity to travel and see the world" might be highly important to several respondents, but some might wish to attain that outcome and others to avoid it). Then respondents could be asked to indicate how available each of these factors are in their current work situation. The algebraic sum of the products of importance times availability could be used as a measure of job satisfaction. In other words, if one says that a highly important aspect of work is highly available in his work situation, it might be assumed that he is satisfied with that aspect of work.

7. Finally, importance might moderate or form a boundary condition on the influence of present job factors on work behavior. Blood (1971) has suggested that this may occur in an all or nothing fashion. That is, some factors may be

trivial and would have little or no effect on work related behavior regardless of the level of satisfaction with them. Other factors may be important enough to have some measurable effect.

The above possible uses of importance data involve a number of implicit questions about the conceptual definition of importance. What kind of a psychological variable is it? How does it operate to influence behavior? What environmental factors influence it? How does it develop over time?

Conceptions of importance

Some of these questions can be stated as hypotheses in the following terms:

1. Importance is a curvilinear function of job satisfaction. Job factors with which the individual is either highly satisfied or highly dissatisfied are perceived as important, while job factors about which the individual feels neutral vis-a-vis job satisfaction are perceived as unimportant. A critical measurement issue here would be to define the neutral point of job satisfaction. Consider pay as an example. Satisfaction with pay might be moderately positive when satisfaction judgments are based on comparisons within the individual's organization, but negative when based on external comparisons or on absolute perceptions of one's worth to the organization.

2. Importance is a motivational variable. Job factors seen as important are those that constitute needs and goals of the individual The respondent who sees the nature of the work as important feels that intrinsic challenge or interest in work constitutes a valued end state with high positive valence. Those who see pay as important feel that economic gain and the things obtainable through money constitute valued goals.

3. Importance is an index of deprivation of needs. The respondent who feels that work itself is important feels his self concept as a person with

valued abilities is threatened unless he has the opportunity to do challenging and interesting work. The person who finds pay important and work unimportant is indicating that economic security is more central to his need system than is identification with intrinsically rewarding work.

4. Job factors seen as important may not be desired end states as such but may be perceived as having potent instrumental links with desired goals. In other words important job factors may be seen as intermediate goals that have value because they are seen as paths to long-term goals. Two respondents may have the same goal of achieving social prominence relative to peers. The one who sees pay as important may feel that pay is a highly probable avenue to such prominence. The one who finds work important may view the desired social status as best attained through identification with high status work activities. Of course, negative instrumentality may also operate. Some might find social prominence through identification with an easy job; one where goofing off without being caught is possible.

5. Importance of job factors may indicate the current salience of factors in a highly dynamic environment. Any factor may be judged as highly important when it happens to catch the respondent's attention. Occasional lack of soap in the washroom may be "important" when it occurs and is noticed, but it occurs rarely and is less likely to be salient at any one time than is a chronic problem like poor pay or supervision. In other words, importance may be determined by a probability distribution of events. This implies that importance judgments are of frequency rather than degree. If so, methods of measurement should take it into account by repeated measures or statements of importance over indicated time periods. If this notion is correct it might also help explain the lack of success Mikes and Hulin (1968) experienced in using the product of importance and job satisfaction to predict turnover. Job

quitting may occur as a result of an incident in which a rare but very negative job condition occurs (e.g., a "blow up" with supervision). The day before the blow up occurs, supervision may not even reach the limen of awareness as a problem, and would ordinarily be rated as unimportant by the respondent.

The above hypotheses are not all mutually exclusive. Hypotheses 2 and 3, for instance, are closely related but focus on positive versus negative incentives. These hypotheses were not formally tested in the research conducted during the period of this project, but they have not to the author's knowledge been stated elsewhere and may serve as a conceptual background for evaluating the methodology to be described.

Indirect measurement of importance

In commenting on the failure of importance weighting to improve the prediction of overall job satisfaction beyond that obtained by the unweighted job satisfaction elements, Blood (1971, p. 488) concludes, "It is unwarranted to expect people to behave in the methodical and orderly manner necessary to provide data that would support the model of behavior implied by the original properties of the formula." Opsahl and Dunnette (1966, p. 106) make a similar point, "It is probably impossible for respondents to detach themselves sufficiently from their present circumstances to be able to give completely accurate self-report estimates of the relative importance of different job aspects." This statement implies, of course, that such estimates should be independent of current job characteristics. This seems unreasonable in light of several of the hypotheses stated earlier, but the point is well taken that direct self-report estimates of the relative importance of job factors may face the respondent with a very difficult task. Opsahl and Dunnette (1966) go on to point out three reasons to mistrust self-report findings of importance of job factors. These involve

(1) social desirability bias, (2) different reinforcement contingencies for the real-life pursuit of money than for saying one is highly motivated to pursue money, and (3) people may simply not know what they really want in a job; they are poor judges and reporters of what factors would really attract and hold them. Vroom (1964) criticizes self report measures of importance because they are unlikely to tap unconscious sources of motivation, and because they may readily be faked if the respondent has something to gain by a certain response.

Nealey (1964, 1970) and Lawler (1971) have criticized the lack of specificity in the way job factors are phrased in the typical self report study of importance. "Earning a fair rate of pay" is likely to be endorsed as important by many more respondents than is "a very high salary," yet both have been used to represent pay. Nealey (1964) also emphasized the importance of quantification of job factors where possible.

The above comments taken together present a rather strong argument for indirect measurement of the importance of job factors. The evidence also points to the need for judgments to be limited to more specific and quantifiable factors rather than general and unspecific factors. It may also be necessary to tap less complex cognitive process than seem to be required for the making of direct importance judgments.

These points may be summarized in the following methodological requirements for an improved measure of importance.

1. The work factors to be judged should be specific and quantified.

2. The judgments should be made in a specific organization context rather than with a general life set.

3. The focus of the importance judgments should be defined. A factor may be important to job satisfaction but not to productivity or turnover.

4. Importance should not be measured by direct self-report techniques. Inferences of importance should be made where possible from less complex verbal

responses or from observation of behavior. For instance, "Would you prefer to work for Supervisor A or B?" is a preference question based on an affective judgment. It involves only one dimension, supervision. The question, "Is supervision more important than pay?" depends on a cognitive judgment and involves two dimensions. The first question is likely to tap more stable and less complex psychological processes.

5. Judgments must be free as possible from social desirability bias or motivation to distort or fake responses.

6. The method should allow some check on reliability.

7. The method should provide a means of scaling the importance of both tangible economic factors like pay and intangible factors like co-workers.

Procedure

The methodology developed in the course of this project met all seven of the requirements specified above. The four job factors involved in the research were specifically defined in the work context in which the data were collected. The respondents were Navy enlisted men aboard four U. S. Navy destroyers. Judgments required of respondents were simple preference judgments involving choices among or ranking of two to four stimuli at a time. These were either all on one dimension or were composites of stimuli from two dimensions. The relative importance of job factors was inferred from the pattern of preference judgments rather than being measured by direct self-report. The focus of the preference judgments was specified as reenlistment, willingness to be productive, or job satisfaction. There was an internal reliability check by means of a count of circular triads, and the method allowed the scaling of tangible and intangible factors.

The method has been described in detail by Nealey (1970). Briefly, respondents make preference judgments among a number of stimuli from one

dimension at a time (several types of work, several supervisors, etc.). Then stimuli from two dimensions are combined to form composites. Respondents next make preference judgments among these two-factor composites. These operations yield preference scale values for the stimuli of each factor and for the composite stimuli formed from two factors. Multiple regression is then used to predict the composite stimuli preference scale values from the preference scale values for stimuli within single factors. The relative importance of the two job factors is inferred from a comparison of the relative size of the beta weights of the two factors. For instance, given a focus on reenlistment, if seven types of work (Navy ratings) and seven supervisors (Chief Petty Officers) are involved, and if the beta weight for work is higher than that for supervision in predicting preferences for composites of these two factors, one might make the following interpretation. If enlisted men were offered some choice among combinations of types of work and supervisors on a second tour of duty, type of work would be more influential in determining their choices than would supervisors. Importance is thus defined operationally as a factor affecting preference judgments.

This approach has been used in three studies involving samples of enlisted men from four destroyers. The first study has been reported in detail by Nealey (1970). This first study employed the paired comparison method to obtain the preference judgments among stimuli from each of the job factors of work, supervision, pay, and co-workers. In the first phase of the study, 91 respondents made preference judgments among stimuli from the job factors one at a time. In the second phase of the study, 97 respondents judged the attractiveness of the composites of job factors. The resulting importance estimates could be made for the total group of respondents or for subgroups such as Electronics Technicians or Boatswain's Mates. Estimates of importance

of job factors for individual respondents were not possible with this early version of the method. In subsequent studies, the preference judgments were made by the "multiple ranking" method (Gullikson and Tucker, 1961). This methodology provides multiple estimates of the preference scale values for each respondent, and makes possible the use of multiple regression analyses to predict each individual respondent's preferences among composites of job factors from his preferences among stimuli from single job factors. Using this approach, it was possible to make importance estimates for individuals. This, in turn, permitted individuals, by means of cluster analytic techniques, to be grouped by their pattern of relative importance of job factors into quite homogeneous sets of respondents.

This general approach was used in two additional studies. The first involved samples of 59 and 67 enlisted men from two destroyers, the USS Horne and the USS Southerland, and the second involved 69 enlisted men from a third destroyer, the USS Hoel.

Results

Transitivity of judgments

Transitivity of the preference judgments that constitute the basic data on which the current approach rests is a necessity. Nealey (1970) reported the transitivity of the paired comparison judgments made on the first ship, the USS Edwards to be very high. This generalization was based on analysis of circular triad frequency in the paired comparison results. On subsequent ships the multiple ranking method was used. This method is a modification of the paired comparison method and also allows one to count circular triads. Kendall (1962) provides a test of significance which enables one to test the hypothesis that a given respondent's judgments in a given section of the questionnaire

are random. Eight respondents were removed from further analyses because this hypothesis could not be rejected at the .01 level for some segment of the questionnaire. The N's quoted above do not include these eight respondents. Therefore, for the 195 remaining respondents we can have high confidence that their preference judgments display acceptable transitivity.

Indirect estimates of overall importance

Estimates of the relative importance of the four job factors (work, supervision, pay, and co-workers) have been made for each of the four destroyers involved with the project. The ranking of these factors in importance is shown in Table 1. Clearly no one factor emerges as most important in general. If any generalization is warranted it is that co-workers are not seen as an important factor. Each of the other three factors was first in importance on at least one ship. The sharp differences between ships indicates that situational determinants of importance play a large role. Of course, the present method of measurement emphasized situational determinants because it used actual Navy work roles, Petty Officers aboard ship, and known groups of co-workers as the preference stimuli. Therefore, the importance scores should be interpreted as reflecting the relative importance of work factors in the respondent's current work situation. The differences across ships indicate that these situations differ. Strictly speaking the only factor that involved identical stimuli across ships is pay. In any case the differences between ships seen in Table 1 would argue against combining samples to draw conclusions about overall importance.

Insert Table 1 & Figure 1 about here

The importance estimates from the three ships where importance was measured for individuals are shown in Figure 1 scaled in terms of mean coefficients of determination of part correlations. In the case of the USS Horne, pay was much the most important factor, while all four factors were fairly comparable in importance on the USS Hoel.

Direct estimates of overall importance

The importance of work factors was also measured by the direct estimate method in the same samples of enlisted men. The method used was a weighted paired-comparison approach in which importance was rated on an eleven-point scale for each pair of work factors. This approach is rather more elegant than the rating and ranking approach is traditionally used, but is still a direct method. The results of this direct approach are shown in Figure 2. By the direct estimate approach, pay was by far the most important factor in all three samples. This can be taken as evidence that the direct approach is less sensitive to situational determinants than is the two-phase method. Comparison of Figures 1 and 2 shows that the two methods gave fairly similar results on the Horne, but on the Hoel there was no relation between the two sets of results.

Insert Figure 2 about here

The differences in results from the direct and indirect method evident by comparison of Figures 1 and 2 was confirmed when the samples from these three ships were combined. Within this total group of 195 the direct and indirect importance scores of each respondent were correlated. The correlations of direct and indirect estimates for the work factors were as follows: Work, r = .183; Pay, r = .088; Supervision, r = -.089; and Co-workers, r = .023.

The correlation for work is significant beyond the .01 level, but the other values fail to reach the .05 level of significance.

Individual importance patterns; the cluster analytic approach

A major objective of the project was to develop a method for measuring individual differences in the relative importance of job factors. Individual estimates of importance are straightforward when using the direct estimate method, but harder to obtain by the two-phase method. Since the two-phase method yields importance inferences based on relative weights within a multiple regression model, it was necessary to obtain from each respondent, multiple estimates of preferences for work factors taken individually and also for composite work factors. This was accomplished by the use of the multiple ranking method (Gulliksen & Tucker, 1961). This technique yields multiple estimates of preference from each respondent. The variability in preference for each stimulus within the estimates from each respondent can thus be used to perform the multiple regression analysis for each individual respondent. These analyses produced an importance score for each of the four work factors. These four scores from each respondent were then subjected to object cluster analysis (Tryon & Bailey, 1970) in order to group together respondents who had similar patterns of importance of work factors.

The cluster analyses from the three destroyers are displayed in Figures 3, 4, and 5. The clusters displayed do not include all the respondents from each ship. Only those clusters containing four or more individuals have been displayed. The homogeneity estimates for these clusters are given in Table 2. Inspection of these values shows all of the clusters displayed to be acceptably homogeneous.

Insert Figures 3, 4, & 5 and Table 2 about here

Several results should be noted. First, there was a good deal of similarity between several of the clusters from all three ships. Cluster 1 is quite similar in form in Figures 3, 4, and 5. The same is true of Clusters 2 and 3. Comparison of Figures 4 and 5 shows that Clusters 4 and 5 are common across two ships. This similarity across ships lends perspective to the dependency of importance on situational determinants. Although, as previously shown, the mean importance values differ across ships (see Figure 1), the similarity in cluster patterns across ships indicates the existence of a common set of determinants. For example, the pattern of importance represented by Cluster 3 on all ships is one in which importance of pay is paramount while the other three work factors are much less important. There were 10 respondents from the Horne with this pattern and 14 each from the Southerland and the Hoel. These 38 enlisted men are similar in their pattern of importance although they come from different situations. On the other hand, Cluster 6 from Figures 5 contains 13 individuals who found supervision highly important and the other work factors unimportant. This cluster was unique to the Hoel and likely indicates the existence of importance determinants on this ship that are absent on the other ships.

The samples from the three ships were also combined to give a total N of 195, and subjected to cluster analyses. Figure 6 shows the three clusters that emerged. These clusters include all of the respondents in the total sample of 195 and are therefore less homogeneous than the clusters from individual ships. The homogeneity estimates for these clusters from the combined sample are also given in Table 2.

The BCTRY clustering approach applied to these data initially yields many highly homogeneous clusters. The combined sample gave 23 such clusters with homogeneities generally above .9. These are then combined in a hierarchial

fashion with similar clusters merging on the basis of Euc'idian distances. It should be noted that the final three clusters retained in Figure 6 are similar in form to Clusters 1, 2, and 3 from the individual ships. These three patterns deserve careful investigation.'

Insert Figure 6 about here

The data from the combined sample of 195 respondents were also subjected to cluster analyses by the NORMIX program developed by John Wolfe at the Navy Personnel and Training Research Laboratory in San Diego. This program has the advantage of a significance test that indicates the optimal number of clusters that should be retained for interpretation. With the present data set seven clusters appeared optimal. These clusters are displayed in Figure 7. The number of respondents in each cluster is an estimate rather than an exact figure. This program assigns probabilities of cluster membership so that a given respondent could be assigned a probability of membership in as many as five different clusters. Typically, however, a respondent will be assigned to one cluster with a probability of .8 or higher and to one or two other clusters with a probability of less than .1. The numbers of respondents shown under each cluster in Figure 7 are based on cluster assignment of .5 or higher. Three respondents of the 195 were assigned to no cluster with a probability of .5.

The NORMIX clusters are quite similar to the clusters from BCTRY shown in Figure 6. NORMIX Clusters 1 and 2 are somewhat similar to BCTRY Cluster 1. NORMIX Cluster 4 is very similar to BCTRY Cluster 2, and NORMIX Clusters 6 and 7 are similar to BCTRY Cluster 3. This leaves only NORMIX Clusters 3 and 5 as unique and both of these clusters have only a few respondents in them.

The NORMIX program computes discriminant functions that distinguish between the clusters it generates. In the seven-cluster solution displayed in Figure 7, the Eigenvalues of the four discriminant functions are as follows: F1 = 7.0551, F2 = 1.4935, F3 = 0.6198, and F4 = 0.1415. Obviously the first function is by far the most discriminating. The weights of the four importance variables on this first function are as follows: Work = .0254, Pay = .3119, Supervision = .0312, and Co-workers = .0111. Just as obviously Pay is the major component of this first function. It thus seems safe to say that the relative importance of pay does more to determine the cluster into which an individual falls than does the importance of any other variable. This does not mean that pay was generally the most important of the four variables (although Figure 1 shows pay was most important on the USS Horne) but only that variance in pay importance was the most important factor in determining clusters of respondents.

Insert Figure 7 about here

The meaning of importance patterns

The interpretation of clusters can be approached from several perspectives. The importance pattern on which clusters are based is the most direct approach to interpretation. Cluster 3, Figure 6, for example is composed of respondents for whom pay is highly important and other factors are much less important. About one third of the total respondents fell in this cluster. A striking pattern like that in Cluster 3 lends itself to an immediate psychological interpretation. The implication is that these individuals are somewhat calculative in their dealings with the Navy and are little affected by non-monetary

aspects of the work environment. The image is one of an "economic man," a conception of employees widely held 40 years ago.

Clusters 1 and 2 of Figure 6 are not so easily interpreted by this direct approach. Cluster 1 does present the image of man highly involved with the work and with the people he works with. Pay and supervision may be seen as extrinsic to this identification with work. Such interpretations are, of course, only hypotheses.

A second approach to the interpretation of cluster patterns is to use them as predictors of future behavior. With respect to retention, one might check to see if respondents from different clusters had different reenlistment percentages. This check is being made with the current respondents, but insufficie time has passed for reenlistment periods to occur for all respondents.

If, as seems likely, importance of a job factor to an individual indicates the factor has motivational importance to that individual one could use importance patterns as the basis of experimental treatments. For example, respondents who hold membership in Cluster 3 in Figure 6 (the "pay" cluster) might be more susceptible to a reenlistment bonus than respondents from Clusters 1 and 2 where pay is less important. Future studies should incorporate such experiments although they would require some important policy changes. Studies of this type would constitute one type of validity check on the importance data.

The main approach taken to cluster interpretation in the current project is based on the objective of discovering the determinants or concomitants of cluster membership. Respondents in a cluster are similar to one another in their pattern of job factor importance. What other things do they have in common, and what are the differences between clusters?

These questions were approached by means of multiple discriminant analyses. In these analyses, 15 variables were tested to see if they would significantly discriminate the members of the several clusters. These 15 variables were measured at the same time the importance estimates were measured. The 15 variables include measures of job satisfaction with work, supervision, co-workers, pay, and promotional opportunity measured by the Job Descriptive Index (Smith, Kendall & Hulin, 1969), a ten-item measure of group atmosphere (Fiedler, 1967), direct estimates of the relative importance of work, pay, supervision, and co-workers described previously, military rank, marital status, years of education, and estimates by the respondent of how much total effort he was making to be productive in his duty assignment and how this effort compared to that of his co-workers.

Of these 15 variables, two variables discriminated significantly among the three BCTRY clusters shown in Figure 6. These variables together with the F values were (1) satisfaction with work as measured by the JDI, $F = 4,813$, df = 2/191, $p < .01$, and (2) direct estimate of importance of co-workers, $F = 3.353$, df = 2/191, $p < .05$. In the stepwise discriminant analysis from which these results emerged, military rank was the third most useful variable in discriminating among clusters, although its F value failed to reach the .05 level.

The means on these three variables for the three BCTRY clusters are displayed in Table 3. The first cluster (in which work and co-workers were important) was the highest in satisfaction with work but low in direct estimate of co-worker importance. On a destroyer, work and co-workers are closely related factors since the rating (boilerman, radioman, etc.) is the major determinant of the work one performs and the co-workers one has. The importance of these two work factors was correlated .55 (N = 195). This correlation was

higher than that of any other pair of work factors. Given this close link in the work environment between work and co-workers, perhaps the current satisfaction wi ork of the members of Cluster 1 is determining their cluster membership and their direct estimate of co-workers as unimportant is true in the general case but not in their Navy duty. Obviously for persons in Cluster 1, the direct estimate of low co-worker importance stands in sharp contrast to the results from the indirect method which showed co-workers to be of high importance.

Insert Table 3 about here

Members of Cluster 2 are lower in rank on the average than are members of the other clusters. Cluster 2 respondents also had high direct estimates of co-worker importance. Perhaps their low rank predisposes members of Cluster 2 to find supervision important.

Cluster 3 respondents are perhaps the easiest of the three clusters to interpret on the basis of the data in Table 3. This group is dissatisfied with work and feels co-workers are unimportant. Since their cluster profile shows they feel pay is highly important, one might conclude that they see pay as the primary compensation for an unrewarding job role. This group also had the lowest mean score on satisfaction with pay, although not significantly so. Since work is not a source of satisfaction for this group, why don't they think work is important rather than pay? Anecdotal evidence suggests that they may feel the work is unmodifiable and thus expect to have their inevitable "bad duty" compensated for by good pay.

The seven NORMIX clusters of Figure 7 were also subjected to stepwise multiple discriminant analyses, but none of the 15 variables discriminated

significantly among them. Military rank just misses significance at the .05 level. Inspection of the mean ranks for groups showed that Cluster 5 of Figure 7 was composed of very low ranking men. In general though, the discriminant analysis approach was not very useful in aiding the interpretation of the NORMIX clusters.

One of the most common conceptions of the meaning of importance links it to job satisfaction. To test this notion, satisfaction with work factors (JDI scores) was correlated with importance of those same work factors as estimated by the indirect method. These correlations were: Work, r = .211; Pay, r = -.027; Supervision, r = -.051; and Co-workers, r = .137. Only the correlation for Work is significant, $p < .01$. Relations between importance and job satisfaction seem not to be very general.

In a final approach to the interpretation of importance scores, multiple correlations were calculated using the 15 variables listed on page 18 as predictors and importance of work factors as criteria. These multiple correlations (N = 195) were as follows: Work, R = .381; Pay, R = .201; Supervision, R = .319; and Co-workers, R = .256. The importance of work was the most predictable while that of pay was the least predictable. However, none of the above multiple correlations are very impressive in size. A good deal of the variance of importance scores remains unaccounted for.

Conclusions

The method of measuring the relative importance of job factors developed in this project appears to improve on the major methodological failings of earlier direct approaches. The response task appeared workable from the respondent's viewpoint. The responses were highly transitive and thus internally consistent. The importance estimates that result from the present

indirect method are more situationally anchored than are direct estimates. It proved possible to group respondents into fairly homogeneous clusters based on their individual patterns of importance. These clusters can be interpreted in several ways. They point to the need for experimental approaches to testing the construct and predictive validity of this approach. That should be the next research step.

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Table 1. Importance of four work factors on four U. S. Navy destroyers.

Importance Rank	Ship			
	Edwards	Horne	Southerland	Hoel
1	Work	Pay	Supervision	Supervision
2	Pay	Work	Pay	Work
3	Co-Workers	Supervision	Work	Pay
4	Supervision	Co-Workers	Co-Workers	Co-Workers

Table 2. Homogeneity estimates of the object clusters for the three ships and for the clusters for the combined sample. (BCTRY)

	Cluster					
	1	2	3	4	5	6
USS Horne	.6897	.8535	.7411	.8166	-----	-----
USS Southerland	.8082	.9085	.7644	.8822	.9503	-----
USS Hoel	.8687	.8690	.8178	.7905	.8726	.8713
Combined sample	.7492	.7106	.6431	-----	-----	-----

Table 3. Mean values of variables that discriminate among three RCTRY clusters.

Discriminating Variable	Cluster 1 Mean N=47	Cluster 2 Mean N=85	Cluster 3 Mean N=63	Grand Mean N=195
Satisfaction with work	27.5	23.1	20.5	23.3
Direct estimate of Co-worker importance	11.5	13.5	11.2	12.3
Military rank	1.4	1.0	1.4	1.2

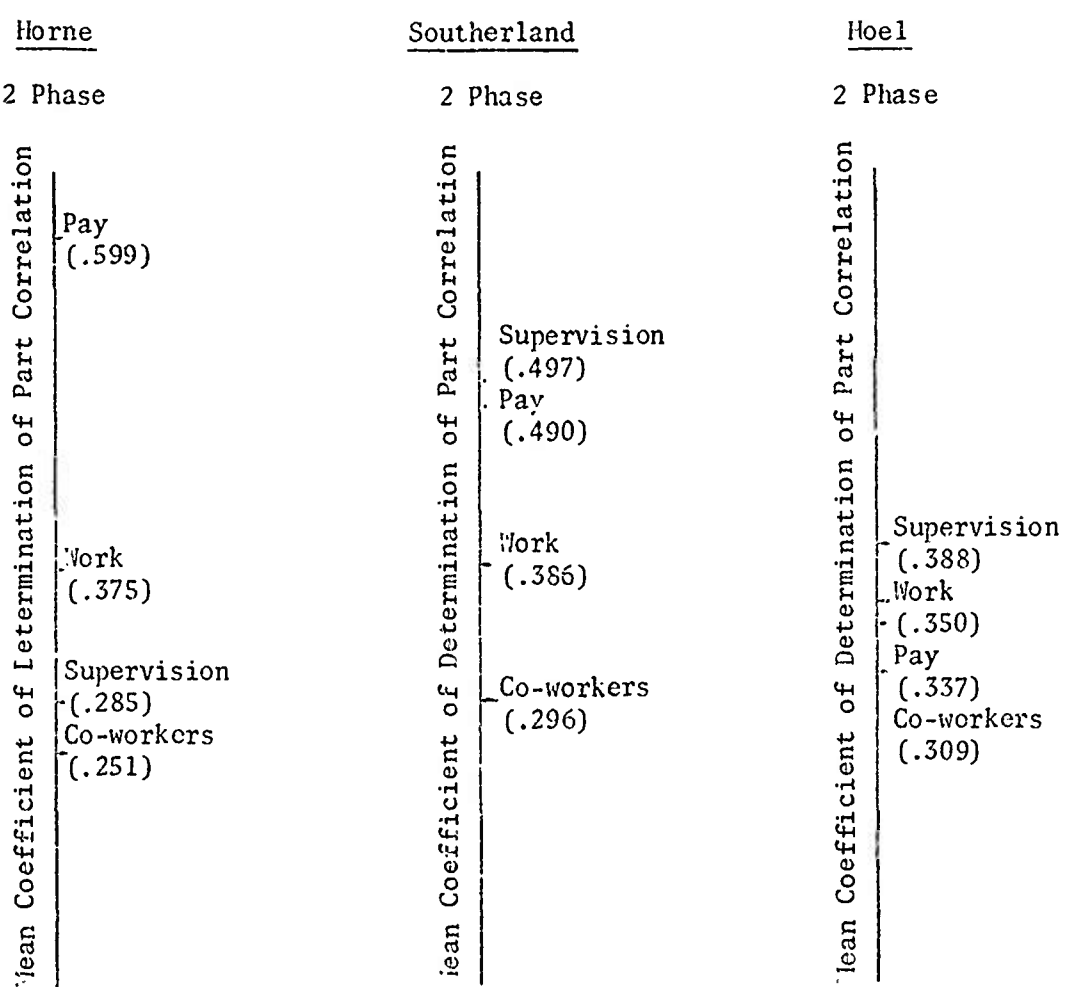


Figure 1. The relative importance of work factors on four destroyers as measured by the two-phase method.

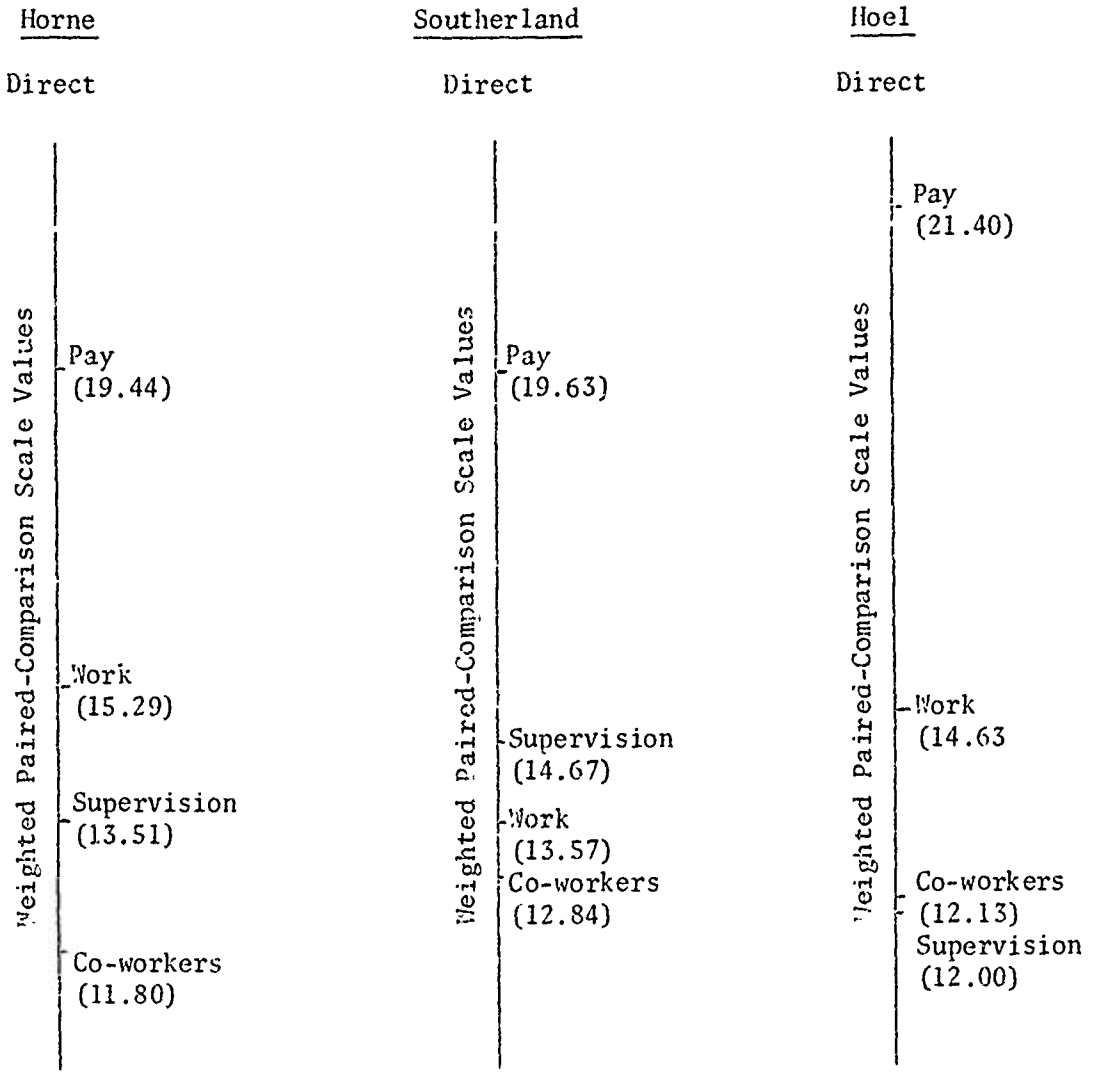


Figure 2. The relative importance of work factors on four destroyers as measured by the direct estimate method.

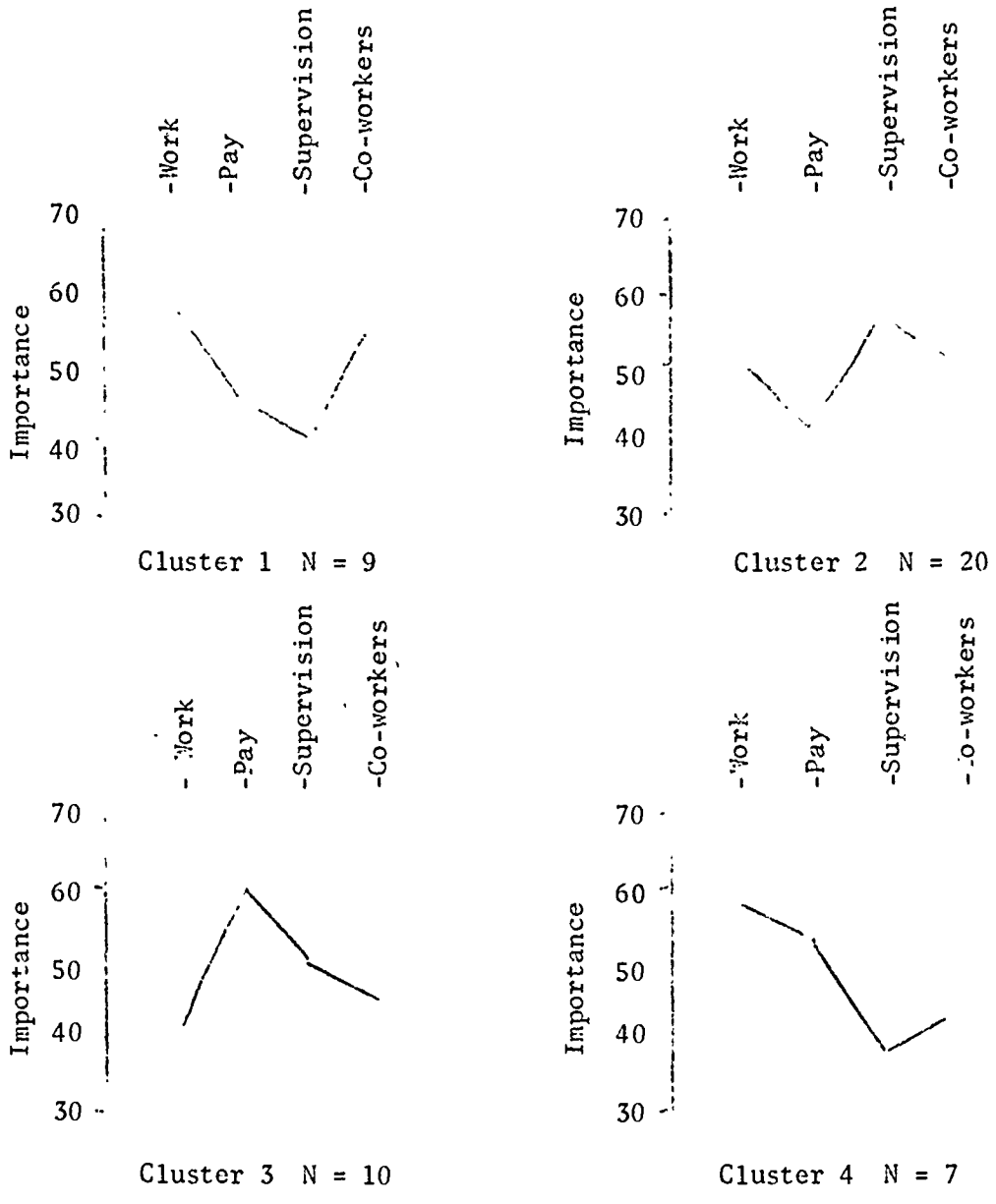
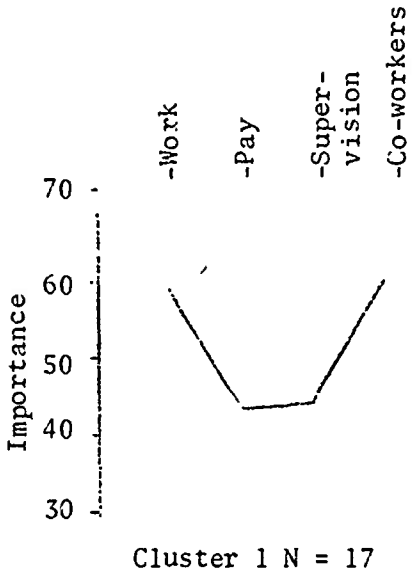
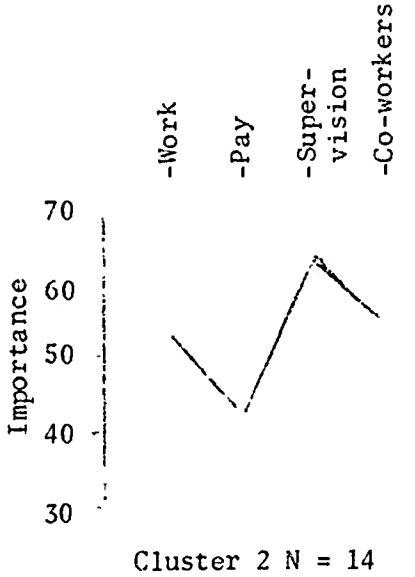


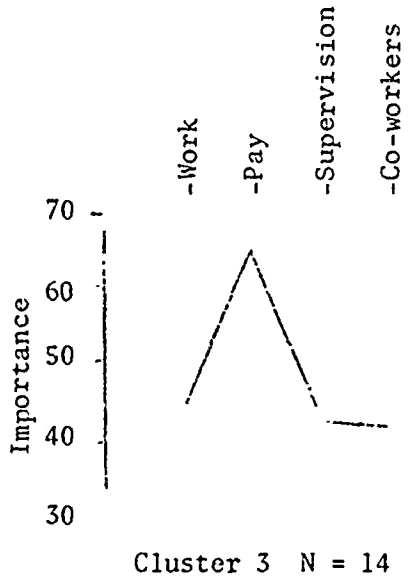
Figure 3. Patterns of relative importance of job factors for four clusters of enlisted men from the USS Horne. The importance scores result from the mean standardized coefficients of determination of part correlation. (BCTRY)



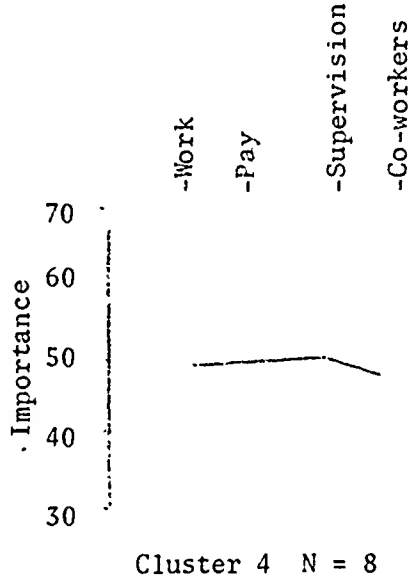
Cluster 1 N = 17



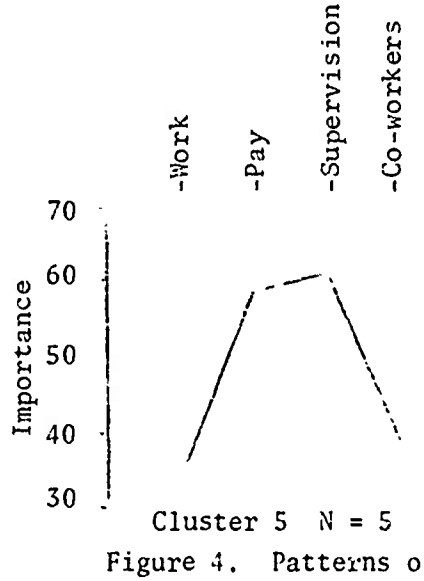
Cluster 2 N = 14



Cluster 3 N = 14



Cluster 4 N = 8



Cluster 5 N = 5

Figure 4. Patterns of relative importance of job factors for five clusters of enlisted men from the USS Southerland. The importance scores result from the mean standardized coefficients of determination of part correlation. (BCTRY)

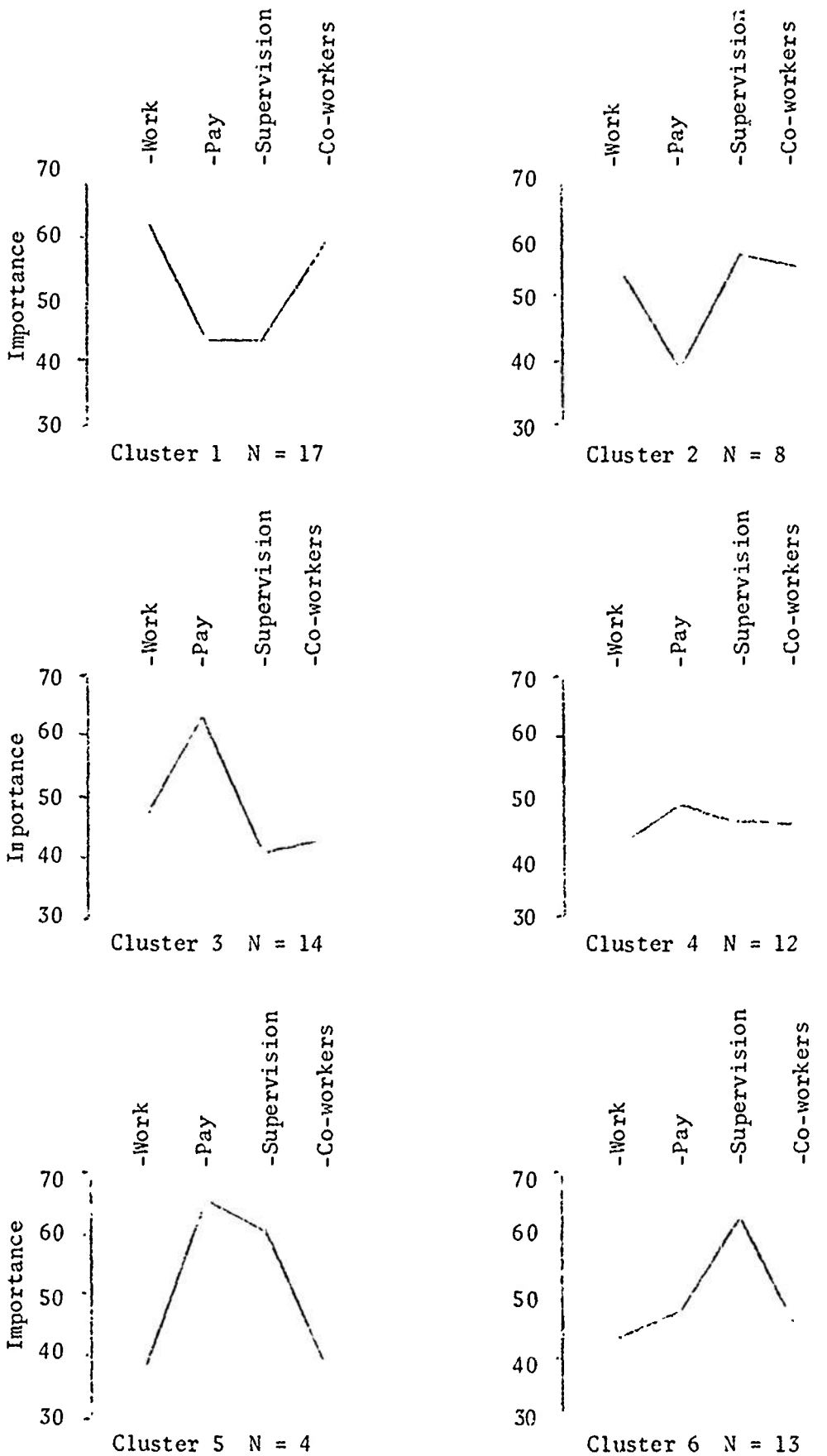


Figure 5. Patterns of relative importance of job factors for six clusters of enlisted men from the USS Hoel. The importance scores result from the mean standardized coefficients of determination of part correlation. (BCTRY)

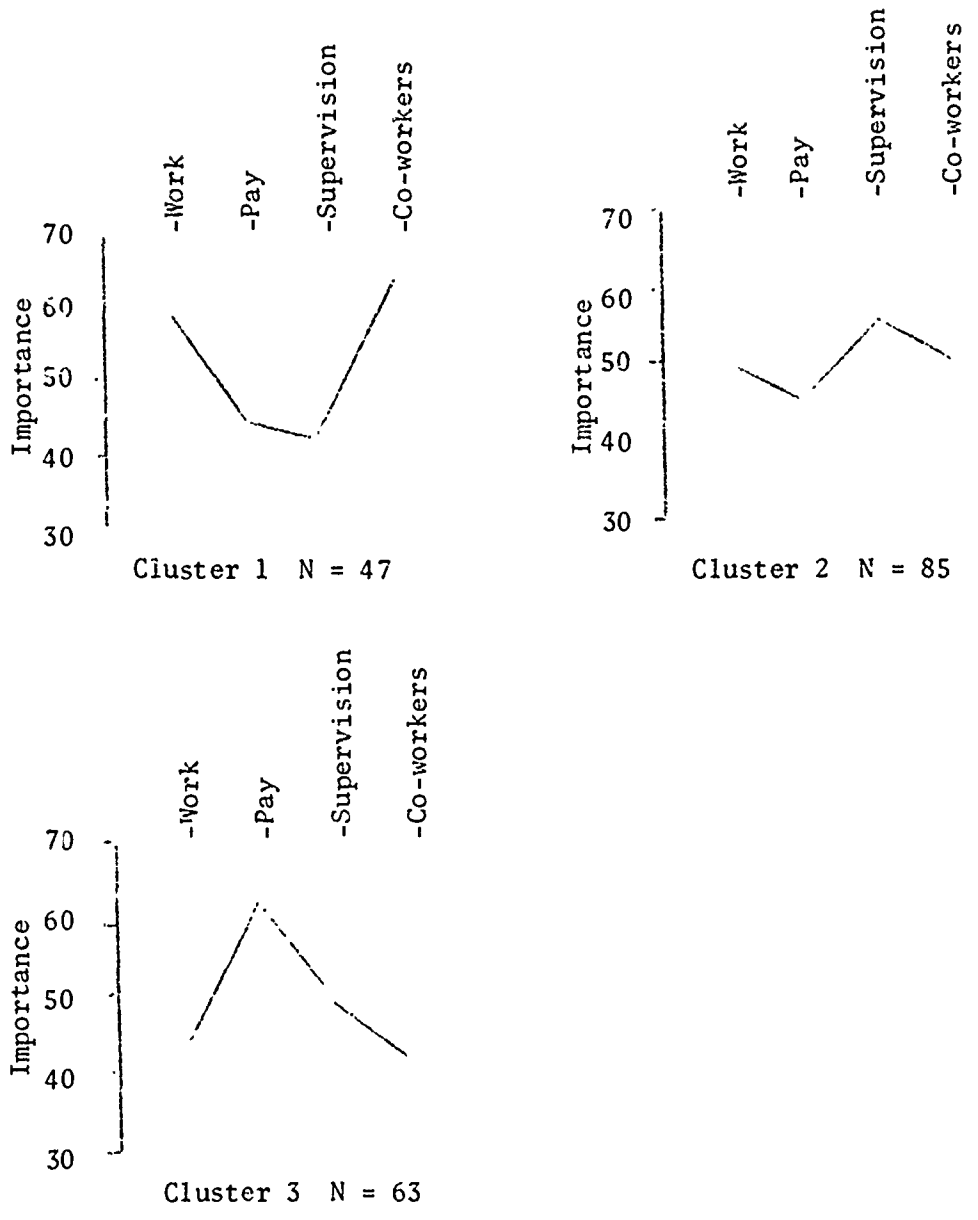


Figure 6. Patterns of relative importance of job factors of enlisted men combined from three U. S. Navy destroyers. The importance scores result from the mean standardized coefficients of determination of part correlation. (BCTRY)

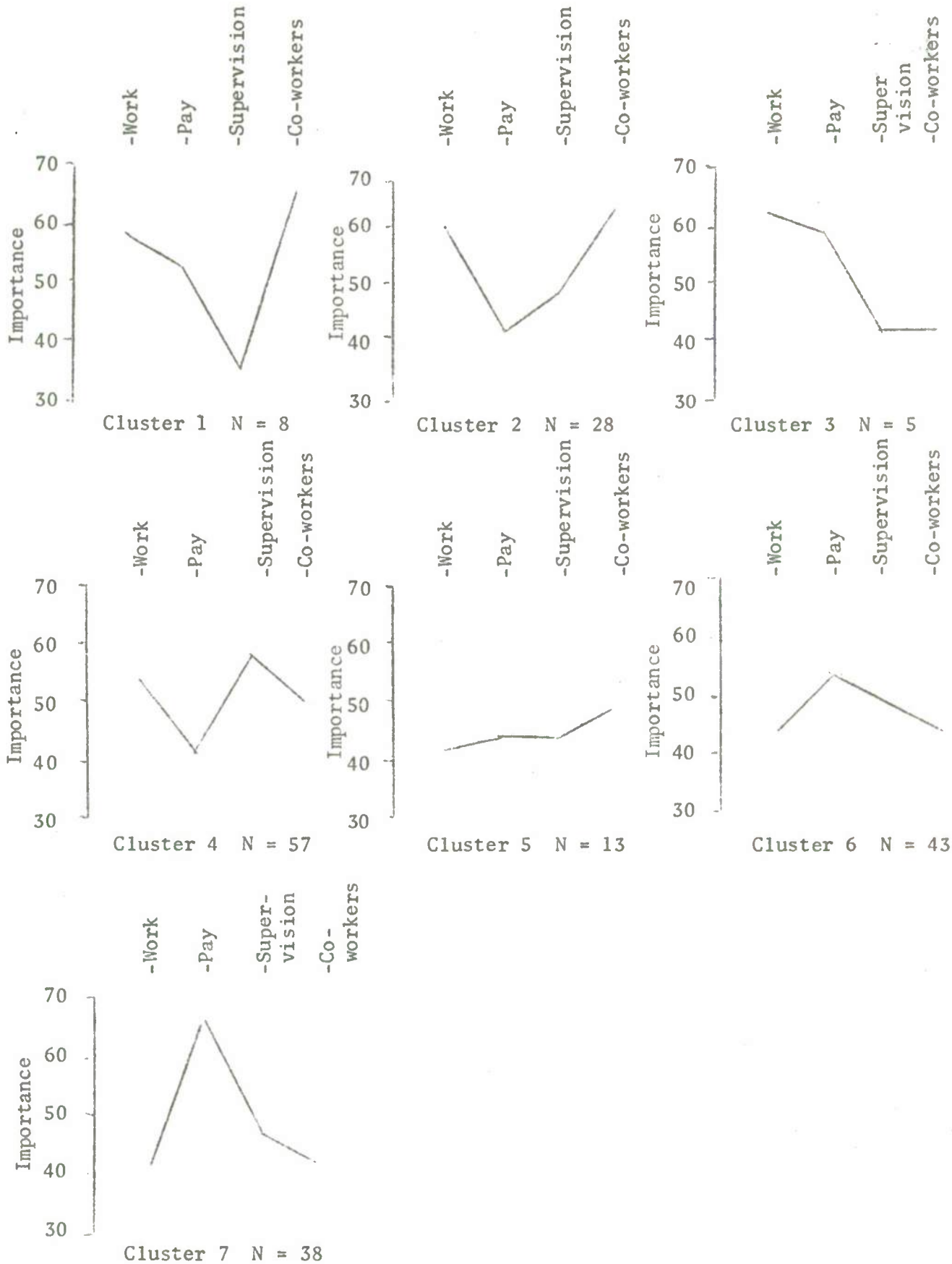


Figure 7. Patterns of relative importance of job factors of enlisted men combined from three U. S. Navy destroyers. The importance scores result from the mean standardized coefficients of determination of part correlation. (NORMIX)

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